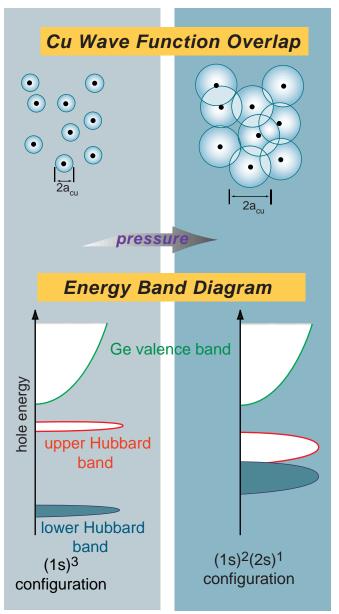


Hubbard Band Formation Observed Directly in Copper-doped Germanium

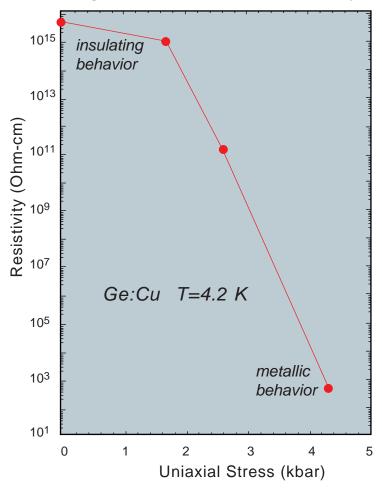




At ambient pressure and at dopant concentations just below the insulator-metal transition, the Cu wave functions do not overlap (upper left), leading to separate Hubbard bands (lower left), and a high resistivity (>10¹⁵ Ohm-cm).

Application of uniaxial stress causes a change in the Cu electronic configuration such that the orbitals overlap. The Hubbard bands are merged into a single, partially filled, metallic band, which is well-separated from the Ge valence band.

Altered electronic configuration under stress leads to a 12 order of magnitude decrease in resistivity



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